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Dirk Schmidt

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EXAMINER

JUETTNER, ANDREW MARK

ART UNIT

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4124

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,854	Applicant(s) SCHMIDT ET AL.	
	Examiner Andrew M. Juettner	Art Unit 4124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 Nov 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05 Nov 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 is dependent on claim 1. Claim 4 recites that the cooling system is based on a physical-mathematical cooling model. Recitation in claim 4 is directed to non-statutory subject matter, an abstract idea. The recitation fails to state a practical application of the abstract idea that results in a physical transformation or a useful, concrete, and tangible result. Without the practical application of the model all that is positively recited in claim 4 is the limitations of claim 1. Therefore, claim 4 fails to further limit the subject matter of claim 1 from which it depends.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3,5,6, and 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the water level" in lines 2 and 4 of claim 3. There is insufficient antecedent basis for this limitation in the claim. Claim 3 is dependant on claim 1. Claim 1 does not recite that there is water or a water level in the cooling basin.

It does recite that water is directed against the both sides of the slabs and sheets but does not require there to be water contained in the cooling basin. Therefore, it is indefinite what water level is to be lowered and what water level the slabs and sheets project above.

Claim 5 recites the limitation "the cooling water jets" in line 3 of claim 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the jet devices" in line 3 of claim 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the carriage is connected to a cable drive." Claim 10 is dependent on claim 9. Claim 9 does provide antecedent basis for the carriage. However, in claim 9 "for a raisable and lowerable carriage that holds a slab or a sheet" is the intended use for the tracks recited and not a positive recitation of a limitation. Claim 10 attempts to modify the carriage however; it is not clear if the carriage as a structure is included as a positive recitation of a limitation. Therefore, claim 10 is indefinite

Claim 11 is dependent on claim 10. Claim 10 is indefinite as noted above. Therefore, claim 11 is indefinite as well.

Claim 12 recites the limitation "the carriage is guided on the tracks by rollers or wheels." Claim 12 is dependent on claim 9. There is antecedent basis for "the carriage." However, as noted above, claim 9 does not recite the carriage as a positive limitation but as the intended use of the tracks. Claim 12 attempts to further modify the

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carriage however it is not clear if the carriage as a structure is included as a positive recitation of a limitation. Therefore, claim 12 is indefinite.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,820,705 to Yu et al. (Yu) in view of US Patent 3,680,344 to Manthey et al. (Manthey '344).

In Reference to Claim 1

Yu teaches:

Method for cooling or quenching slabs and sheets with water in a cooling basin (62), wherein cooling water is directed against both sides of the slabs and sheets (spray heads 60; see fig. 4., column 11, lines 42-46).

Yu does not explicitly disclose:

The slabs and sheets, which have first been set upright by a tilting device, are lowered and temporarily maintained on edge.

Manthey '344 teaches:

The slabs and sheets (1), which have first been set upright by a tilting device (jaws 4 tilt slab 1; see fig. 1, column 2, lines 33-43), are lowered and temporarily

maintained on edge (slabs 1 are lowered in pool 6 by crane 16; see fig. 1, column 3, lines 10-15).

It would have been obvious to one having ordinary skill in the art at the time of the invention to add the tilting device as taught by Manthey '344 to the cooling basin of Yu in order to quench or cool a flat slab without pockets of steam (due to flash boiling of the quenching liquid) from collecting along the lower surface of the slab resulting in uneven cooling as occurs when quenched while in a substantially horizontal position as taught by Manthey '344 (column 1, lines 13-18).

In Reference to Claim 3

Yu as modified by Manthey '344 teaches:

Method in accordance with Claim 1 (see rejection of claim 1 above), wherein the water level in the cooling basin is lowered, the slabs and sheets project above the water level, and cooling water is directed at the slabs and sheets (Yu column 16, line 64-column 17 line 2; partial immersion of part along with spray quenching).

As noted above claim 3 is indefinite because it recites that "the water level in the cooling basin is lowered" which lacks antecedent basis in claim 1. For the purposes of compact prosecution claim 3 is being interpreted as having a water level in the basin that is less than full. The water level in Yu is less than filling the cooling basin (see fig. 4).

In Reference to Claim 4

Yu as modified by Manthey '344 teaches the method in accordance with claim 1; see rejection of claim 1 above. Claim 4 depends from claim 1 and fails to further limit

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the subject matter of claim 1, see objection to claim 4 above. Therefore, claim 4 is rejected as being obvious to one having ordinary skill in the art at the time of the invention in view of Yu as modified by Manthey '344 in the rejection of claim 1 above.

In Reference to Claim 5

Yu as modified by Manthey '344 teaches:

Method in accordance with Claim 1, wherein the water pressure and/or the volume flow of the cooling water jets is automatically controlled (Yu column 11 line 59-column 12 line 19; microprocessor controls valves for that control the flow of the cooling water and the air and carbon dioxide mixed therein; Manthey '344 column 3, lines 55-56; automatic programmer can used to control circulation of cooling water used in the cooling basin through the use of valves).

As noted above claim 5 is indefinite because it recites "the cooling water jets" which lack antecedent basis in claim 1. For the purposes of compact prosecution the cooling water jets is being interpreted as the water directed against the slabs.

In Reference to Claim 7

Yu teaches:

Device for cooling or quenching slabs and sheets with water in a cooling basin (see fig. 4), especially for carrying out the method in accordance with Claim 1, wherein the cooling basin has jet devices (60), which are arranged on both sides of the lowered slabs/sheets (spray heads 60 are in two groups with work piece to be inserted between them; see fig. 4, column 11, lines 43-46), are directed towards their broadside surfaces, and are connected to a cooling water

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circulation (see fig. 4, column 11, lines 47-67), which has means for lowering the water level from a maximum, upper water level to a low, lower water level (means-plus-function, corresponding structure is pump to remove water from basin; exit port 66 with a pump 72 and overflow port 68).

Yu does not disclose:

The slabs and sheets, which have first been set upright by a tilting device, are lowered and temporarily maintained on edge.

Manthey '344 teaches:

The slabs and sheets (1), which have first been set upright by a tilting device (jaws 4 tilt slab 1; see fig. 1, column 2, lines 33-43), are lowered and temporarily maintained on edge (slabs 1 are lowered in pool 6 by crane 16; see fig. 1, column 3, lines 10-15).

As noted above in the rejection of claim 1, it would have been obvious to one having ordinary skill in the art at the time of the invention to add the tilting device of Manthey '344 to the cooling basin of Yu in order to quench a flat slab without pockets of steam collecting along the surface of the flat slab resulting in uneven cooling as taught by Manthey '344.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yu in view of Manthey '344 as applied to claim 1 above, and further in view of US Patent 3,556,877 to Ujiie (Ujiie).

Yu as modified by Manthey '344 teaches the method in accordance with claim 1 (see rejection of claim 1 above) but fails to disclose wherein the slabs and sheets are

fully immersed in a cooling basin filled with water, and, in addition, cooling water is directed against them in the water bath of the cooling basin.

Ujiie teaches wherein the slabs and sheets (9, work piece to be quenched, in this case a tubular structure) are fully immersed in a cooling basin filled with water (part of tubular structure be quenched is immersed; Column 2, lines 35-41), and, in addition, cooling water is directed against them in the water bath of the cooling basin (cooling medium injection pipes 5 spray cooling medium on both sides of immersed tubular structure that is immersed, see fig. 1, column 2, lines 15-21).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the cooling basin of Yu to use the sprayer heads (60) on a part immersed in cooling medium as taught by Ujiie in order to facilitate the quenching process as taught by Ujiie (column 2, line 65-66).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yu in view of Manthey '344 as applied to claim 1 above, and further in view of US Patent 3,738,629 to Coleman (Coleman). As noted above claim 6 is indefinite because "the jet devices" lacks antecedent basis. For the purposes of compact prosecution the jet devices is interpreted as jet devices for directing the cooling water.

Yu as modified by Manthey teaches the method in accordance with claim 1 (see rejection of claim 1 above), but does not disclose wherein the distance of the jet devices from the surface of the slabs and sheets is automatically controlled.

Coleman teaches the distance of the jet devices from the surface of the slabs and sheets being automatically controlled. Coleman discloses that as a work piece

pass between rolls 92, 94, roll 92 is forced upward (column 7, lines 11-13). As roll 92 is forced upward, yokes 160 are also directed upward so that link chains 166, 168 raise quenching manifold F upwardly (column 7, lines 21-24). Coleman explicitly teaches that this be done in order to facilitate symmetrical quenching fluid spray pattern to the work piece (abstract, column 7, lines 30-32).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the cooling basin of Yu with a sprayer adjusting mechanism as taught by Coleman in order that a symmetrical cooling spray pattern can be maintained. One having ordinary skill in the art would know how to adapt the sprayer adjusting mechanism of Coleman for use in the cooling basin of Yu.

8. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Yu in view of Manthey '344 as applied to claim 7 above, and further in view of US Patent 5,795,538 to Abukawa et al. (Abukawa).

Yu as modified by Manthey '344 teaches the device in accordance with Claim 7 (see rejection of claim 7 above), but does not disclose wherein the cooling basin is connected by flow with a pump receiving basin.

Abukawa teaches wherein the cooling basin (8) is connected by flow (see fig. 4) with a pump receiving basin (tank 2 receives overflow from quenching chamber 8 and is connected to a circulation system with a pump 12, see fig. 4).

It would have been obvious to one having ordinary skill in the art at the time of the invention to add a pump receiving basin as taught by Abukawa to the cooling basin of Yu in order to collect overflow cooling water and re-circulate the cooling water.

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9. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu in view of Manthey '344 as applied to claim 7 above, and further in view of US Patent 4,036,243 to Manthey et al. (Manthey '243).

In Reference to Claim 9

Yu as modified by Manthey '344 teaches a device in accordance with Claim 7 (see rejection of claim 7 above), but does not disclose wherein the cooling basin is designed with tracks for a raisable and lowerable carriage that holds a slab or a sheet.

Manthey '243 teaches wherein the cooling basin is designed with tracks (guide rails 13',13", see fig.2, 3) for a raisable and lowerable carriage that holds a slab or a sheet (13', 13" guide path of carriage, column 3, lines 5-7).

It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute the lowering device of Manthey '243 with the tracks for the lowering device of the cooling basin of Manthey '344 in order to reduce the weight of the device as explicitly taught by Manthey '243 referring to Manthey '344 (column 1, lines 49-52).

In Reference to Claim 10

Yu as modified by Manthey '344 and Manthey '243 teaches:

Device in accordance with Claim 9 (see rejection of claim 9 above), wherein the carriage (16) is connected to a cable drive (cable 23 connected to pulley 24 and driven by hoist motor 27; see column 3, lines 5-10 and lines 46-50).

As noted above, “the carriage” was not a positive recitation of a limitation in claim 9.

For the purposes of compact prosecution claim 10 is interpreted as reciting that a carriage is provided that is connected to a cable drive.

In Reference to Claim 11

Yu as modified by Manthey '344 and Manthey '243 teaches:

Device in accordance with Claim 10 (see rejection of claim 10 above), wherein the cable drive has cables (23; column 3, line 48), which are guided by cable drums mounted on the carriage (pulley or sprocket 24), and the cable drums are mechanically coupled (sprockets 24 are on a common shaft 25) with a frequency-controlled three-phase motor (hoist motor 27 with transmission 26).

In Reference to Claim 12

Yu as modified by Manthey '344 and Manthey '243 teaches:

Device in accordance with Claim 9 (see rejection of claim 9 above), wherein the carriage (16) is guided on the tracks (13', 13'') by rollers or wheels (17; see fig. 2, 3; column 3, lines 5-7).

As noted above, the carriage is not a positive recitation of a limitation in claim 9. For the purposes of compact prosecution claim 12 is interpreted as reciting that a carriage is provided that is guided on the tracks by rollers or wheels.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tada et al. discloses a method of spraying water on a slab while it is immersed in a bath. The spraying of water on a part immersed in water facilitates

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the quenching process by removing steam bubbles and films bring about direct conduction between the slab and water increasing the coefficient of heat transfer (US Patent 6,250,370 to Tada et al. (Tada) column 4, lines30-39). Tada specifies a range of the distance from the nozzles to the slab surface from 30 to 500mm. Clumpner discloses that it is necessary to spray with sufficient velocity to penetrate the vapor film that is formed on the surface of the body being quenched. Fox discloses a quench bath with spray heads located above it to spray work pieces on both sides, as they are lower on an elevator from a furnace into the bath. Thome discloses an apparatus for cooling a metal strip that includes having sprayer heads on both side of the strip spraying water on the strip before it is immersed in a bath. Mantovan et al. discloses having sprayers above a cooling bath and in a cooling bath.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew M. Juettner whose telephone number is (571) 270-5053. The examiner can normally be reached on Monday through Friday 7:30am to 5pm Est..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Bomberg can be reached on (571) 272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMJ

/A. M. J./

/Joseph S. Del Sole/
Supervisory Patent Examiner, Art Unit 4123